Forest Insect Conditions on the

Targhee National Forest

1968

The following is an evaluation of current forest insect conditions on the Targhee National Forest in 1968. This report is based on past reports, on-the-ground surveys and evaluations, and aerial survey information.

The mountain pine beetle continues to be the focal point of attention. Although portions of the infestation have declined, other portions have continued or become established. A slight increase in spruce budworm defoliation was evident, spruce beetle epicenters became much more apparent from the air, and sugar pine tortrix feeding approximately equaled that of 1967. A more detailed description of these conditions follows:

Mountain pine beetle, Dendroctonus ponderosae

The overall mountain pine beetle situation on the Targhee National Forest in 1968 essentially reflects population trends that were evident in 1967. Generally, the infestation in the current treating area can be summarized as follows. The greatest population increase is from the Cave Falls Road north to Moose Creek Plateau along the Yellowstone National Park boundary. Significant pine mortality also extends west across the southern portion of the treating area.

With the exception of Big Bend Ridge, the timber west of Highway 191 is definitely undergoing a decline in tree mortality. Although that area west of the highway endured up to one new tree attack for every 1967 attack, the actual numbers of attacks are low, varying from two per acre in the south to less than one per acre elsewhere. The western portion of the treating area is mixed in type and many stands of pure lodgepole sawtimber have been logged.

The situation within the current treatment area is depicted by the following data acquired through a relatively intensive 3-week on-the-ground survey conducted by Forest and Regional personnel. To facilitate an interpretation of this report, the reader is referred to the 1968 Aerial Survey map.

TARGHEE NATIONAL FOREST MOUNTAIN PINE BEETLE TREATMENT AREA
SEPTEMBER 1968

Treatment Block	Contractual Units	1968 Attacks Per Acre	Buildup Ratio 1968:1967	Cumulative Percent Mortality
1	Rising Butte Horseshoe Lake	2.76	0.9:1	12.4
2	Rock Creek Reiman	1.90	0.7:1	10.9

Treatment Block	Contractual Units	1968 Attacks Per Acre	Buildup Ratio 1968:1967	Cumulative Percent Mortality
3	Robinson Creek Snow Creek Horsefly Spring	3.02	0.7:1	18.1
4	Dry Robinson Boundary Creek	4.01	1.9:1	12.4
5	North Fork North Butte	0.77	0.7:1	7.1
6	Moose Creek Bear Spring	3.40	0.7:1	15.9
7	Flat Canyon Trail Canyon	4.50	1.1:1	18.8
8	Warm River Butte Warm River Fish Creek Lower Robinson	1.58	0.5:1	10.2
9	Survey Draw Upper Flat Canyon Lower Flat Canyon	2.41	0.9:1	3.3
10	East Beaver Beaver Pond Gerrit	1.75	0.5:1	14.0
11	Elk Butte	1.24	0.7:1	11.6
12	Grandview East Mesa West Mesa	1.22	0.8:1	7.2
13	North Anderson South Anderson	0.80	0.6:1	11.1
14	Sheep Falls	1.49	2.1:1	11.5
15	East Riverside West Riverside	0.60	1.0:1	9.2
16	Eccles Butte Pineview	0.91	0.7:1	2.1

Treatment Block	Contractual Units	1968 Attacks Per Acre	Buildup Ratio 1968:1967	Cumulative Percent Mortality
17	Osborne Butte Hatchery Butte Osborne Spring	0.84	1.2:1	4.3
18	Last Chance Eccles Ripley Butte	0.77	0.3:1	3.4
19	Island Park Siding Chick Creek	0,24	0.7:1	1.9
20	N. R.R. Ranch	0.14	0.5:1	3.7
21	Island Park FA Area	0.19	4.8:1	7.6
22	Thurburn Ridge West End	0.81	0.7:1	9.3
23	S. R.R. Ranch Swan Lake Fish Pond	0.61	1.1:1	2.8
24	Smead Canyon Green Canyon Bear Canyon	0.97	--	5.2
25	Bishop Burn Davis Lake	0.79	0.5:1	20.0
26	Fogg Butte West Bishop Antelope Spring Lyle Spring	0.77	0.6:1	14.3
27	Jackson Mill North Big Bend High Point	1.03	1.1:1	8.3
28	Sadorus Mill South Big Bend	2.44	2.0:1	13.5
29	South Partridge North Partridge Big Grassy	0.84	--	3.1

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Treatment Block	Contractual Units	1968 Attacks Per Acre	Buildup Ratio 1968:1967	Cumulative Percent Mortality
30	South Black Mountain South Baker East Baker West Black Mountain Black Mountain Spring	1.19	--	3.8

The above tabulations demonstrate that the greatest density of new attacks (two or more per acre) exists generally east of Warm River and in the South Big Bend Ridge area west of Highway 191 near Ashton. Stands enduring one to two attacked trees per acre are in the area west of Black Mountain and southeast of Island Park Siding, in the remaining pine type of the High Point vicinity, and in those blocks from Porcupine Ranger Station northwest to Pineview and Elk Butte (blocks 2, 8, 10, 11, 12, and 14).

All treating blocks supporting two or more 1968 attacks per acre also had buildup ratios (1968:1967) of about 1:1 and as high as 2:1. Most of the pine near the southwest corner of Yellowstone Park supported two or more new hits per acre and many of those stands possess the highest level of cumulative mortality, 10 percent and over. The South Big Bend Ridge country also falls in this category. Blocks 25 and 26 have less than an attack per acre and have at least 10-percent cumulative stand mortality.

The present treating area is currently being considered for a more integrated beetle prevention and suppression program in which chemical treatment would be augmented by conversion of certain stands to less susceptible size classes through timber harvest.

While an active infestation is progressing in adjacent Yellowstone Park and on the Forest south of the Cave Falls Road, most of the Rexburg and Spencer Ranger Districts' beetle populations are definitely down from recent years.

Foresters from the Division of Timber Management established 32 clusters of plots between the Cave Falls Road and the North Fork of Teton River. On a total of 340 20-BAF variable plots, it was found that the average d.b.h. and height of lodgepole pine in the area are 12 inches and 70 feet, respectively. This indicates that from the standpoint of size classes alone there is sufficient timber to sustain the existing outbreak. The following data indicate the present status of 1,444 lodgepole pine examined:

Total No. Trees on Plots	Green Trees		Previous Attacks		1968 Attacks		All Attacks	
	No.	%	No.	%	No.	%	No.	%
1,444	1,007	70	205	14	232	16	437	30

The current population upswing is evident from the fact that more trees were attacked in 1968 than in all recent years combined. In addition to the above cruise, Regional entomologists checked mortality along an 18-acre strip in Conant Creek, and found 149 new attacks compared with only 21 from last year. The increase in groups of faders was striking. By late September, most egg galleries were well developed, but larval galleries were only one to two millimeters long.

The insect condition in adjacent Yellowstone Park will have a marked influence on the Targhee portion of the mountain pine beetle infestation. In the Bechler River vicinity of the Park, Regional entomologists and Park personnel recorded averages of 20 new attacks per acre in independent field surveys. This rapidly increasing infestation remains a continuing threat to the lodgepole stands of both the Park and the Forest.

The variable infestation trends in the southernmost portion of the Forest are evident from the following tree attack buildup ratios:

Sample Location	Buildup Ratio 1968	1967	Trend
McRenold Reservoir Rd.	0.9	1	Static to increasing
N. Fork Badger Creek	1.2	1	Increasing
End of Dry Ridge Rd.	2.1	1	Increasing
Ridge S. of Bustle Cr.	0.5	1	Decreasing
Teton Creek	1.1	1	Static
Lower Spring Creek	0.5	1	Static
Darby Creek	1.8	1	Increasing
North Fork Pine Cr.	3.5	1	Increasing
West Pine Cr.	2.2	1	Increasing
Mike Spencer Canyon	1.3	1 (low count)	Static to decreasing
North Fork Horseshoe Cr.	0.3	1 (low count)	Decreasing
Calamity Creek	0.7	1 (low count)	Static to decreasing
Moody Swamp	0.5	1	Static to decreasing

Along the McRenold Reservoir Road, entomologists tallied 56 1968 and 66 1967 attacks along a 2-mile transect. The area sampled represents 16 acres and included residual stands adjacent to recent clearcuts as well as uncut stands. Although the ratio represents considerable area and indicates approximately a 1:1 relationship, the absolute numbers of attacks the last two seasons are relatively high. Under this condition, appreciable mortality can accumulate even though the insect population is killing trees at a constant or static rate. A timber sale of between 15 and 25 MM bd. ft. was initiated this season and cutting has progressed very rapidly. The harvest has effectively utilized many sawtimber-size lodgepole pine that would otherwise undoubtedly succumb to the beetle in the very near future. In addition to the utilization of threatened timber, logging has destroyed broods in the trees that were cut prior to flight. It is questionable, however, if any significant degree of beetle control in the overall surrounding area has been accomplished. The main benefits from harvest are those of utilization and stand conversion.

Along the North Fork of Badger Creek, attack ratios were tallied to the road's end. There were 278 new (1968) attacks and 238 old (1967) attacks. Although the data indicate a static situation, most of the new attacks were observed above the Jackpine Creek cutoff. This is typical of many drainages in which beetle populations reach epidemic levels at higher elevations through successive years. The reasons for this so-called "movement" up drainages are not entirely clear from a biological standpoint. There is very likely a buildup from within these stands as well as invasion flights from lower elevations.

Differences in brood development also apparently differ somewhat by elevation. On September 25, broods at the 9,000-foot elevation of Dry Ridge were characterized by egg gallery starts measuring only three inches to four inches, and occasionally ten inches. They contained eggs, but no larvae were found. Blue stain was established in trees having the longest galleries. At the 7,600-foot level, most egg galleries were nearly ten inches long with many reaching 18 inches. Although some eggs were still present, many of them had hatched and larval mines had been started. Blue stain appeared in most trees attacked this year.

The beetle population on Dry Ridge is increasing. The infestation from Bustle Creek south to the Spring Creek vicinity is continuing, but not with any appreciable upsurge. This is primarily due to expanses of mixed stand composition. On ten variable cruise plots (BAF 10), 12 trees were attacked this year compared with 24 in 1967 and 16 in 1966. The average d.b.h. of the 52 plot trees killed in the 3-year period was 11.0 inches. The average for all 98 trees on the plots was 9.9 inches. For conclusive results, additional sample trees would be necessary, but there is an indication that mortality has occurred in larger than average trees.

The vicinity of Darby Creek is currently sustaining an increasing trend. The lodgepole pine in the vicinity of North Fork Pine Creek, West Pine Creek, and Mike Spencer Canyon is also undergoing increased mortality.

On most of the Rexburg District a striking infestation decline continues. Only some lower portions of the drainages support lingering numbers of faders. It is noteworthy that some stands such as the one around Moody Swamp consist of residual sawlog and pole-size lodgepole pine. Such stands are in contrast to surrounding timber which underwent severe mortality in recent years. The situation points up the fact that beetle-caused tree losses may at times reach alarming levels, particularly while the red-topped faders still retain their foliage, but a residual stand of desirable size classes may still survive.

The management question is not whether any stand can survive in the beetle's wake, but rather, whether the residual stand will be adequate enough to satisfy specific management plans or uses for the area in question.

Spruce budworm, Choristoneura occidentalis

Although the overall spruce budworm populations on the Forest did not return to the higher levels of several years ago, a general increase was apparent this season in the southeast corner of the Forest as well as on the adjacent Teton, Bridger, and Caribou Forests.

The following is a 4-year tabulation of defoliation by damage class, as recorded by the aerial survey. It shows a reversal from the downward trend of the past three years.

Year	Acres By Defoliation Intensity			
	Light	Medium	Heavy	Total
1965	46,100	42,600	9,200	97,900
1966	14,600	--	--	14,600
1967	6,300	3,700	--	10,000
1968	4,260	9,680	2,960	16,900

Although the budworm overwinters as a small well protected larva, a sampling of egg masses in late summer can yield an estimate of defoliation the following summer. Such samples were taken in Wolf and Cabin Creeks. The following data resulted:

Area	No. egg masses per 1,000 sq. in. foliage 1968	Percent estimated defoliation 1969*	Trend
Wolf Creek	0.7	<15%	Static to increasing
Cabin Creek	2.0	<15%	Static to increasing

*Defoliation by low populations primarily affects new foliage; higher budworm populations consume an increasing amount of older needles.

The 1968 population fed on the current foliage of Douglas-fir, subalpine fir, and Engelmann spruce from Cottonwood Creek east along the Snake River to Pole Canyon and north into Dog Creek. Although not readily apparent from the above table, this area is expected to sustain defoliation at the same or somewhat greater level in 1969. Comparable but more intensive sampling on the nearby Bridger and Teton Forests indicates an even greater increase in both defoliation intensity and size of area for 1969. The Targhee infestation is just a fringe of this 132,660-acre outbreak. No conclusive damage studies have been undertaken with local budworm populations in the past. Research from other geographic regions indicates, however, that the greatest "damage" to the host trees may be that of radial increment loss. Mortality probably occurs only after repeated seasons of fairly heavy defoliation. We cannot yet be sure just how many years of feeding at a given level exceed a critical threshold of host tolerance. Inasmuch as heavy defoliation first occurred this season and then on only about 3,000 acres, we do not recommend control at this time regardless of the particular multiple use value or values under consideration.

Close surveillance of the budworm condition will be continued in 1969.

Spruce beetle, Dendroctonus obesus

The 1968 aerial survey map indicates observable spruce beetle activity on the southwestern portion of the Forest. Beetle-killed Engelmann spruce were found in groups of up to about ten trees and in some cases as many as twenty to thirty. A few groups were detected between Mike Spencer Canyon and Upper Palisade Lake, but most of them are located from Moose Creek (near Teton Pass) southeasterly along the Snake River Range to Cabin Creek.

To obtain a representative estimate of the beetle situation, Regional entomologists examined the most obvious portion of the infestation, that in the North and South Forks of Elk Creek. Spruce beetle galleries were found in occasional old windfalls dating back several years. The current situation is best described as a slight upsurge in stand attrition. The trend does not, however, seem to be increasing at a high rate. Very few new attacks are to be found around existing epicenters, and woodpecker predation is very prevalent. It is possible that some newly attacked trees are highly scattered. Logging activity on the North Fork will eliminate one patch of about 12 trees attacked over the past three years. The sale is laid out in prime quality spruce. With an existing insect population in the area, proper slash removal is imperative.

In conclusion, spruce beetle-caused mortality is definitely in excess of recent years. Ground examinations indicate that no catastrophic buildup is eminent. There is reason to believe that mortality may continue next year at at least the same level as in 1968.

Sugar pine tortrix, Choristoneura lambertiana

A defoliator long associated with lodgepole pine on the Targhee Forest, the tortrix, continues to defoliate all age classes of trees. Tree damage is

restricted to new foliage and most feeding is observed in the understory or smaller trees. Feeding damage is quite inconspicuous from the air, and ground evaluations have been recently used to monitor the infestation. Most of the heavier defoliation was observed from the Dry Creek-Rock Hollow area south to Teton Creek. The tortrix populations in the Bishop Burn area continue to decline. Long-term damage notably takes the form of radial increment loss and branch deformity in trees of low vigor or which grow on poor sites. Mortality has not been observed on the Forest. The damage is not severe enough to justify control measures at present.

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